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Foster D. Hinshaw

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EXAMINER

FLEURANTIN, JEAN B

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/666,729	Applicant(s) HINSHAW ET AL.	
	Examiner JEAN B. FLEURANTIN	Art Unit 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-38 and 40-47 is/are rejected.
- 7) ☒ Claim(s) 13 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This is in response to Applicant(s) arguments filed on 11/13/2007.

The following is the current status of claims:

Claims 1-38 remain pending for examination.

The Terminal Disclaimer filed on 11/13/2007 has been entered and fully considered.

Applicant's arguments filed 11/13/2007, with respect to claims 1-47 have been fully considered but they are not persuasive for the following reasons, see sections I (response to arguments) and II (repeated rejections).

Response to Arguments

I. Applicant's arguments start from page 13 through page 16.

Applicant's arguments with respect to claims 1-47 have been fully considered but they are not persuasive in part. Because, the prior art of record discloses the claimed limitations.

Applicant indicates, page 13, section (*Objections to the Specification*), that ". . . the Specification as originally filed describes exemplary embodiments of the invention including a plurality of "software operators": "In particular, each Job 1-7 is formed of a respective sequence of operations using software operators SCAN, RESTRICT, PROJECT, SAVE AS, BROADCAST AS, JOIN WITH, GROUP BY, RETURN, etc. In a given sequence, etc."

"The Abstract is being amended to correct this error."

The arguments have been fully considered and are persuasive. Therefore, the objections have been withdrawn.

Applicant indicates, page 14, section (*Double Patenting*), that "A Terminal Disclaimer is being filed concurrently with this Amendment to disclaim any terminal part of a patent that may issue from the Application that extends beyond the expiration of U.S. Patent Applications No.10/668,113 and 10/667,128. Accordingly, the double patenting rejection of Claim 1 is believed to be overcome."

The arguments have been fully considered and are persuasive. Therefore, the rejections have been withdrawn.

Applicant indicates, page 14, section (*Double Patenting*), that ". . . Claims 30 and 47 have been amended to clarify the scope of the invention, and Claim 30 now recites "using a plurality of software operators, processing data according to a logical data flow." Support for this amendment is found at least on page 50, line 26 - page 51, line 18 of the Specification as originally filed. By processing data at a plurality of software operators and transmitting record data, the claimed method provides processed data at nodes in the network, which is a useful and tangible result. As a result of this amendment, it is believed that the § 101 rejection of Claims 30-47 is overcome."

The arguments have been fully considered and are persuasive. Therefore, the rejections have been withdrawn.

Applicant's arguments, page 11, section (*Rejection of Claims 1-12, 14-38 and 40-47 under 35 U.S.C. § 103(a)*), that "Kabra does not disclose a data processor arranged as recited in Claim 1. As stated above, Kabra describes a method of coordinating parallel execution of a query on multiple data servers. In contrast to "the JPU of the present invention, however, the data servers 130 of Kabra are not "responsive to requests from host computers and from other JPUs to process data" (emphasis added). As shown in Fig. 6A, each data server 130A-B executes a respective portion of the plan."

It is noted that Kabra discloses the client transmits a request for the master data; see col. 11, 50-54. Further, in col. 7, lines 19-26, Kabra discloses the communication is between processors on a symmetric multiprocessing system, memory used as the transport vehicle.

In response to applicant's argument, page 16, that "no combination of Kabra and Tao teaches or suggests the present invention," the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the instant application relates to data processing systems that make use of multiple processing unit groups, and in particular to an asymmetric architecture that allows for autonomous and asynchronous operation of processing units and streaming of record data processing; see specification page 2, lines 4-10.

Accordingly, Kabra discloses the database system, a client server architecture, query scheduler, query coordinator and data servers; see col. 7, lines 2-26. Further, col. 9, lines 31-34, Kabra discloses Information and argument transmitting over network from one node to another.

Tao discloses a database management system, data containers are referred to as objects classes; see col. 6, lines 58-66.

Therefore, the combination of Kabra in view of Tao discloses the claimed limitations.

Furthermore, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

MPEP 2111: During patent examination, the pending claims must be "given the broadest reasonable interpretation consistent with the specification" Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In *re Prater*, 162 USPQ 541,550-51 (CCPA 1969). The court found that applicant was advocating ... the impermissible importation of subject matter from the specification into the claim. See also *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997) (The court held that the PTO is not required, in the course of prosecution, to interpret claims in applications in the same manner as a court would interpret claims in an infringement suit. Rather, the "PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definition or otherwise that may be afforded by the written description contained in application's specification.").

The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. In *re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999).

For the above reasons, it is believed that the last Office Action dated 09 August 2007 was proper. Therefore, the rejection is maintained.

Claim Rejections - 35 USC § 103

II. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 14-38 and 40-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,507,834 issued to Kabra et al., ("Kabra") in view of USPN 7,191,169 issued to Tao ("Tao").

As per claim 1, Kabra discloses "an asymmetric data processor comprising: one or more host computers, each including a memory, a network interface and at least one CPU, each host computer being responsive to requests from end users and applications to process data" (i.e., user interface, SQL queries, transforms query into extended SQL syntax and transmits to data server; see col. 9, line 66 to col. 10, line 5);

~~"one or more a plurality of~~ Job Processing Units (JPUs), each having a memory, a network interface, one or more storage devices, and at least one CPU, each JPU being responsive to requests from host computers and from other JPUs to process data" (i.e., transmission control protocol or message passing interface can be utilized to transfer the information, the communication is between processors on a symmetric multiprocessing system, memory used as the transport vehicle; see col. 7, lines 19-26 & Fig. 1);

"a network enabling the host computers and the JPUs to communicate between and amongst each other, each of the host computers and JPUs forming a respective node on the network" (i.e., transmitting over network from one node to another; see col. 9, lines 31-34); ~~"and a plurality of software operators that allow each node~~ configured to process data at the nodes according to a logical data flow, wherein in a record-by-record, streaming fashion in which (i) for each operator in a given sequence of operators in the logical flow" (see col. 9, line 66 to col. 10, line 11), ~~"and (ii) data processing follows a logical data flow and~~ at each operator is based on readiness of a record, such that ~~as soon as a subject record~~ the operator transmits is ready record data ~~is passed for processing from one part to a next part at~~

a successive operator in the logical data transmission flow" (see col. 8, lines 9-16), "independent of transmission at other operators of ready record data during data processing being substantially continuous so as to form a stream of record processing from operator to operator within nodes and across nodes of the network" (i.e., using network streams across a communication network via a transport protocol for transmitting data; see col. 7, line 61 to col. 8, line 3).

Kabra fails to explicitly disclose output of the operator is input to a respective succeeding operator in the sequence in a manner free of necessarily materializing data. However, Tao discloses output of the operator is input to a respective succeeding operator in the sequence in a manner free of necessarily materializing data (see Tao col. 9, lines 36-42). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process of Kabra by respective succeeding operator in a manner free of necessarily materializing data as disclosed by Tao (see Tao col. 9, lines 47-50). Such a modification would allow the process of Kabra to provide data view data, when the base tables of a materialized view are modified, corresponding changes are made to the materialized view, lead to a cost saving (see Tao col. 3, lines 27-36), thereby, improving the accuracy of the asymmetric streaming record data processor method and apparatus.

As per claim 2, Kabra discloses "the record data in the stream of record processing may exist in various states at different parts in the data flow, and the parts in the logical data flow include on disk storage, within JPU memory, on the network, within host computer memory, and within an ODBC connection with an end user or application" (see col. 14, lines 46-57).

As per claim 3, Kabra discloses "the plurality of operators includes a merge aggregation operator that determines record readiness based on a key index value, such that the merge aggregation operator aggregates a sorted record stream and outputs the aggregation associated with a current key index value whenever a new key index value is received as input" (see col. 8, lines 25-42).

As per claim 4, Kabra discloses "record readiness is determined by buffer status such that a communication layer sends a partial set of records across the network when its buffers are filled, without waiting for a working sequence of operators that produced the record data to complete before any records are sent across the network" (see col. 14, lines 46-57).

As per claim 5, Kabra further discloses "at least one programmable streaming data processor (PSDP) coupled to a respective JPU, the PSDP being one part in the logical data flow and processing data fields within records as buffers of records are received from a storage disk or an external network connection, without waiting to process any records until all records are received" (see col. 12, line 54 to col. 13, line 24).

As per claim 6, Kabra discloses "the data fields are processed by the PSDP to produce virtual fields" (see col. 16, lines 14-15).

As per claim 7, Kabra discloses "the virtual fields are selected from a group consisting of: a row address, pad words (tuple scratch pad), a Boolean results from each of the filter operations, a hash result, a tuple null vector, a tuple length, and combinations thereof" (see col. 8, lines 17-23).

As per claim 8, Kabra discloses "each software operator follows a common data handling paradigm such that each operator can operate in any part of the logical data flow, the common data handling including each operator being able to accept one or more streams of record data as inputs and producing a stream of record data as an output" (see col. 9, lines 60-65).

As per claim 9, Kabra discloses "any operator may take as its input a stream of record data that is produced as the output of any other operator" (see col. 7, line 66 to col. 8, line 1).

As per claim 10, Kabra discloses "certain ones of the operators materialize data and do so as sets of records" (see col. 8, lines 33-37).

As per claim 11, Kabra discloses "the operators further enable same algorithms to be used for a given operation whether that operation is executed on the host computers or on the JPUs" (see col. 7, line 61 to col. 8, line 16).

As per claim 12, in addition to claim 1, Kabra further discloses "record data are processed at intermediate parts on the logical data flow" (see col. 8, lines 6-9).

As per claim 14, Kabra discloses "the JPU's CPU eliminates unnecessary data before it is sent across the network" (see col. 8, lines 63-65).

As per claim 15, Kabra discloses "at least one of the host computers eliminates unnecessary information before processing a next step of a subject query" (see col. 16, lines 5-6).

As per claim 16, Kabra discloses "the host computers further include a Plan Generator component, the Plan Generator component generating record data processing plans having operations which take input streams of record data and produce streams of record data as output and which avoid intermediate materialization" (see col. 16, lines 10-15).

As per claim 17, Kabra discloses "the host computers further include a Communication Layer API that accepts data records as input to a message sent to one or more other nodes" (see col. 11, lines 24-29).

As per claim 18, Kabra discloses "the host computers further include: a Job Listener component for awaiting data from other nodes; and an API which provides streams of record data as output" (see col. 9, lines 60-65).

As per claim 19, Kabra discloses "the host computers further comprise a Host Event Handler component for managing execution of a query execution plan, the Host Event Handler receiving partial result sets from JPUs through the Job Listener component" (see col. 9, lines 9-37).

As per claims 20 and 21, Kabra discloses "the host computers further comprise a Host Event Handler for managing execution of a query execution plan, the Host Event Handler communicating to JPUs through a Communication Layer component to request partial result sets from JPUs" (see col. 9, lines 27-51).

As per claims 22 and 23, in addition to claim 1, Kabra further discloses "performs multiple operations on each field value in turn while each field value is held in a host CPU cache" (see col. 7, lines 19-26).

As per claims 24 and 25, Kabra discloses "the JPUs separate the stream of record processing from source of the record data such that various input sources to the JPUs are permitted" (see col. 11, lines 50-54 and Fig. 6A).

As per claim 26, Kabra discloses "the JPUs further comprise a Network Poster component which accepts a stream of record data as input and which sends data to other nodes when its buffers are filled, when jobs are completed or upon an explicit request to do so" (see col. 11, lines 5-16 and Fig. 5).

As per claim 27, Kabra discloses "the JPUs further comprise a Storage Manager component whose API and implementation provide for storage and retrieval of record sets" (see col. 5, lines 29-37).

As per claims 28 and 29, Kabra discloses "the host computers are of a symmetric multiprocessing arrangement and the JPUs are of a massively parallel processing arrangement" (see col. 5, lines 27-34).

As per claims 30-38 and 40-47, the limitations of claims 30-38 and 40-47 are similar to claims 1-12 and 14-29, therefore, the limitations of 30-38 and 40-47 are rejected in the analysis of claims 1-12 and 14-29, and these claims are rejected on that basis.

Claim Objections / Allowable Subject Matter

Claims 13 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

CONTACT INFORMATION

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEAN B. FLEURANTIN whose telephone number is 571 – 272-4035. The examiner can normally be reached on 7:05 to 4:35.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOHN E BREENE can be reached on 571 – 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jean Bolte Fleurantin

Primary Patent Examiner

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